

WHAT IS CLAIMED IS:

1. A mandrel having a mounting block and for use with an automatic packaging machine and having a mounting block for coupling to the automatic packaging machine, the mandrel comprising:

a package-holding assembly operatively connected to the mounting block, the package-holding assembly rotatable about a first axis from a first position to a second position; and

a flap holder assembly operatively connected to the mounting block, the flap holder assembly rotatable about a second axis substantially perpendicular to the first axis.

2. The mandrel of claim 1, further comprising a lateral support member coupled to the mounting block, wherein the package-holding assembly is rotatably connected to the lateral support member.

3. The mandrel of claim 2, further comprising means for maintaining the package-holding assembly in the first position relative to the lateral support member.

4. The mandrel of claim 3, wherein the maintaining means comprises a latching member coupled to the lateral support member, the latching member releaseably mating with a bushing on the package-holding assembly.

5. The mandrel of claim 3, wherein the package-holding assembly comprises a plurality of gripping arms, the plurality of gripping arms selectively permitting a package blank to be captured by the package-holding assembly.

6. The mandrel of claim 5, wherein the package-holding assembly further comprises a guide mechanism positioned within the plurality of gripping arms, the guide mechanism holding the package blank during the assembly thereof.

7. The mandrel of claim 2, wherein the flap holder assembly includes a plurality of side arms for contacting portions of a package blank.
8. A mandrel for use with an automatic packaging machine in forming a package with a flip-top, comprising:
 - a mounting block for coupling the mandrel to the automatic packaging machine,
 - a package-holding assembly operatively connected to the mounting block, the package-holding assembly having a free end and a fixed end, the free end having a secured position and an unsecured position and being rotatable about a first axis between the secured position and the unsecured position;
 - a lateral support member coupled to the mounting block, wherein the package-holding assembly is rotatably connected to the lateral support member;
 - a latch coupled to the lateral support member for releasably connecting the free end of the package-holding assembly; and
 - a flap holder assembly operatively connected to the mounting block, the flap holder assembly rotatable about a second axis substantially perpendicular to the first axis.
9. The mandrel of claim 8, wherein the package-holding assembly includes a plurality of gripping arms for selectively permitting a package blank to be captured by the package-holding assembly.
10. The mandrel of claim 9, wherein the package-holding assembly further comprises a guide mechanism positioned within the plurality of gripping arms, the guide mechanism holding the package blank during the assembly thereof.

11. The mandrel of claim 8, wherein the flap holder assembly includes a plurality of side arms for contacting portions of a package blank.
12. An automatic packaging machine for forming a latching flip-top box from a blank, comprising:
 - a conveyor system;
 - a plurality of mandrels coupled to the conveyor system, each of the plurality of mandrels comprising:
 - a mounting block for coupling the mandrel to the automatic packaging machine,
 - a package-holding assembly operatively connected to the mounting block, the package-holding assembly rotatable about a first axis from a first position to a second position; and
 - a flap holder assembly operatively connected to the mounting block, the flap holder assembly rotatable about a second axis substantially perpendicular to the first axis,
 - a plurality of plows, each of the plurality of plows manipulating a portion of the blank in order to form portions of the box; and
 - a plurality of tucker assemblies, each of the plurality of plows manipulating a portion of the blank in order to form portions of the box.
13. The automatic packaging machine of claim 12, wherein each of the plurality of mandrels includes a lateral support member coupled to the mounting block, wherein the package-holding assembly is rotatably connected to the lateral support member.
14. The automatic packaging machine of claim 13, wherein each of the plurality of mandrels includes means for maintaining the package-holding assembly in the first position relative to the lateral support member.

15. The automatic packaging machine of claim 14, wherein the maintaining means comprises a latching member coupled to the lateral support member, the latching member releaseably mating with a bushing on the package-holding assembly.
16. The automatic packaging machine of claim 12, wherein the package-holding assembly comprises a plurality of gripping arms, the plurality of gripping arms selectively permitting a package blank to be captured by the package-holding assembly.
17. The automatic packaging machine of claim 16, wherein the package-holding assembly further comprises a guide mechanism positioned within the plurality of gripping arms, the guide mechanism holding the package blank during the assembly thereof.
18. The automatic packaging machine of claim 13, wherein the flap holder assembly includes a plurality of side arms for manipulating portions of the blank.
19. A method of forming a latching flip-top box having a flip-top portion hingedly connected to the box along a minor axis of the box, comprising the steps of:
 - providing a box blank;
 - placing the unitary box blank in a mandrel, the mandrel, coupled to a conveyor system and comprising:
 - a package-holding assembly rotatable about a first axis from a first position to a second position; and
 - a flap holder assembly operatively connected to the package-holding assembly, the flap holder assembly rotatable from a retracted position to an extended position about a second axis substantially perpendicular to the first axis,

folding a first lower flap of the box blank with a first plow;

folding a second lower flap of the box blank onto the first lower flap with a second plow;

folding a third lower flap of the box blank onto the second lower flap with a third plow;

applying an adhesive to the third lower flap;

folding a fourth lower flap of the box blank onto the third lower flap with a fourth plow;

rotating the package-holding assembly about the first axis from the first position to the second position;

folding a first front upper panel of the box blank with a first tucker assembly;

folding a latching panel of the box blank using the first tucker assembly;

folding a second front upper panel of the box blank using a fifth plow;

rotating the flap holder assembly from the retracted position to the extended position, the flap holder assembly folding a flip top panel and first and second flip-top wing panels of the box blank;

folding a first wing panel of the box blank using a second tucker assembly;

folding a second wing panel of the box blank using the second tucker assembly;

applying adhesive to either exposed surfaces on the first and second wing panels or an underside of a front flip-top panel;

folding the front flip-top panel onto the exposed surfaces of the first and second wing panels using a sixth plow;

rotating the flap holder assembly from the extended position to the retracted position – is this the correct position?;

rotating the package-holding assembly about the first axis from the second position to the first position;

folding a first rear upper panel of the box blank using a seventh plow;

applying adhesive to either an exposed surface on the first rear upper panel or an underside of a second rear upper panel;

folding the second rear upper panel onto the exposed surface of the first rear upper panel using an eighth plow.

20. The method of claim 19, further comprising the step of using a ninth plow to eject the latching flip-top box from the mandrel.

21. The method of claim 19, wherein the mandrel includes a latching mechanism for releasably securing the package-holding assembly in the first position.

22. The method of claim 19, wherein the package-holding assembly includes a plurality of gripping arms, the plurality of gripping arms opening to allow a box blank to enter the package-holding assembly.